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FIG. 4. Greatly enlarged view of the central portion of Fig. 2, showing dark spaces within the membrane between the dividing chromatophores; this part of the membrane is becoming double.

FIG. 5. Protoplasmic threads in the leaf-cells of *Astrophyllum sylvaticum*.

FIG. 6. Dividing chromatophores of *Ageratum conyzoides*, showing the pitted surface, the laterally projecting ridges (in optical section) and the central spaces between the dividing chromatophores. Diagram.

FIG. 7. Leaf-cell of *Astrophyllum*, showing nucleus, chromatophores and protoplasmic threads.

FIG. 8. Transverse vertical section of leaf-cells of *Astrophyllum*, showing chromatophores, nucleus and protoplasmic threads.

Proceedings of the Botanical Club, A. A. A. S., Brooklyn Meeting, August 15-22, 1894.

The meetings were held in the Packer Institute.

FRIDAY MORNING, AUGUST 17TH.

The meeting was called to order by Professor N. L. Britton, and in the absence of the President, Prof. D. H. Campbell, Prof. Geo. F. Atkinson was elected to the office of President.

Prof. F. C. Newcombe was elected to the Secretary's office in the absence of Mr. W. T. Swingle.

The report of the Secretary was read, showing for the year ending Aug. 14, 1894, receipts to the amount of \$8, and an equal amount of disbursements. The report was accepted. Voluntary contributions to the amount of \$7.32 were made by those present.

Prof. C. E. Bessey then gave some notes on the germination of macrospores of *Marsilia vestita*. These were germinated in water, forming larger prothallia with rhizoids than are usually present in this genus.

Dr. Erwin F. Smith recommended the preliminary treatment of vegetable sections with tannin solution, in order by subsequent staining to differentiate micro-organisms present in the tissues.

Prof. F. C. Newcombe also spoke favorably of tannin solution as aiding in the differentiation of protoplasmic structure by subsequent staining.

Dr. W. J. Beal showed how measurements of parts may be helpful in the identification of grasses.

Prof. L. R. Jones reported that the raising of oats in Vermont imported from localities affected with smut tended to decrease the percentage of the disease.

Prof. N. L. Britton thought that the return of the oat to its native environment—that being probably similar to the conditions in Vermont—might cause a reversion to its original healthy growth.

Prof. B. T. Galloway was inclined to ascribe the decrease of smut in Vermont to conditions unfavorable to the germination of the sporidia.

Prof. B. T. Galloway, Dr. E. F. Smith and Mr. G. H. Hicks reported on the use of formaline as a preserving fluid, stating that in a 1 per cent. solution it is cheaper than alcohol, and for a period of several months, while it has been in use, it has preserved the colors of persistent leaves, fleshy fungi, and fruits much better than alcohol.

Prof. J. M. Coulter then called for the report of the Committee charged with the preparation of a check-list of Northeastern American plants.

Prof. N. L. Britton, Chairman of the Committee, reported that about two-thirds of the list was already printed and that the remainder would be printed as soon as possible. The delay in completing the project was due to the great amount of time required in verifying references. The Editor of the Torrey Botanical Club had offered to print the list as one of its MEMOIRS, and the offer had been accepted by the Committee as the most practicable means that had presented itself. The regular price of the MEMOIRS is \$3.00 per volume, but this volume would be given to subscribers to a list now before the Club for \$1.00. After the subscribers had been supplied the price would be raised to \$3.00. The subscription list would be kept open until the work is issued. The report was accepted and the committee continued to complete the check-list.

Prof. C. E. Bessey suggested a board or cloth binding. Dr. Britton stated that the volume would consist of about 400 printed pages and bound in cloth would cost about \$1.25 to subscribers. After considerable discussion it was finally understood that subscribers were to have a choice of bound and unbound copies, the unbound to cost \$1.00 and the bound \$1.25.

FRIDAY AFTERNOON, AUGUST 17TH.

Dr. E. F. Smith in the Chair.

Dr. Smith then presented "Additional Notes on the bacterial Disease of Cucumbers, with an Exhibit of Photomicrographs." The cause of the disease lies in the filling of the vessels by the growth in them of bacteria, thus stopping the flow of water.

Prof. C. E. Bessey spoke on "Extreme Decapitalization," in nomenclature, suggesting that the Club might do good by sending to publishers who violate usage a statement of accepted practice. Prof. B. T. Galloway moved that a committee of three be appointed to take the matter under consideration. The motion was carried, and the Chair announced that he would name the committee later.

Prof. L. R. Jones recommended a form of *Hæmatococcus* for class demonstration of motile gametes.

The same speaker exhibited a method of showing leaves between glass plates to classes of students.

MONDAY MORNING, AUGUST 20TH.

The meeting was called to order by the President, who announced Mr. Elias J. Durand to speak on "Sporangial Trichomes in certain Ferns."

Trichomes occur more or less abundantly on the sporangia of certain ferns, especially those of the genera *Phegopteris* and *Polypodium*. The occurrence is constant and not accidental. In the instances already observed these hairs, which are either acute or capitate, are always found on the lateral wall of the sporangium near the annulus. So far as noted trichomes occur on the sporangia of such ferns only as have similar ones on the surface of the frond. The occurrence of trichomes on sporangia is consistent with the known epidermal nature of the latter. The function of sporangial hairs may be protective, as they occur most abundantly on non-indusiate ferns.

Mr. Arthur Hollick spoke on "Stipules and their Significance from the Standpoint of Palæobotany."

The material upon which these remarks is based was collected from the Laramie horizon near Walsenberg, Colo., for the late Prof. J. S. Newberry, but was not described by him. The geo-

logical side of the subject was discussed in a paper read before Section E, but some points of biologic interest it was thought best to present before the Botanical Club in an informal way.

The specimens in question represent a new fossil species of *Liriodendron*, which is unique inasmuch as the petioles of the leaves are bordered by wing-like appendages, a quarter of an inch or more in width. Similar appendages are known in other genera, and it is a matter of importance to know just what they represent.

Platanus occidentalis shows basilar expansions of its leaves extending down the petioles, besides conspicuous foliaceous stipules at the base of the petioles. The significance of these has been shown by Prof. Lester F. Ward in his "Palæontologic History of the Genus *Platanus*,"* in which he advocates the theory that the stipular appendages represent portions of the lower part of the leaf-blades which have become separated and crowded down the petiole.

With this new species of *Liriodendron* we are apparently now in a position to treat this genus in the same manner and to consider the conspicuous stipules which are on the young branches, but soon disappear, as possibly the ultimate development of the wing-like appendages along the petioles of our Laramie fossil, which in turn may be merely separated portions of the bases of the leaf blades. This interpretation involves the whole question of the importance and significance of stipules in general and what they really represent in the living flora. The remarks were illustrated by drawings of fossil species of *Liriodendron* and *Platanus* and mounted specimens of *L. Tulipifera* and *P. occidentalis*.

Prof. C. R. Barnes communicated the fact that the sporophyte stage of *Bryoziplium* (*Eustichium*) *Norvegicum*, found ten years or more ago in Wisconsin by Mrs. E. G. Britton, and which had not been reported since, were collected in great quantities the present summer by Mr. Cheney. It seems certain that this moss does not often fruit.

Mr. J. J. Davis reported *Entyloma Flærkeæ* as forming its chains of gonidia in a broken instead of in a straight line.

* Proc. U. S. Nat. Mus. 11: 39-42.

TUESDAY MORNING, AUGUST 21ST.

Prof. B. D. Halsted exhibited photographs of variegated leaves made by the Solandi method, the description of the same having been published in a former number of the BULLETIN.

Prof. C. E. Bessey spoke for "A better Pronunciation of botanical Terms." After citing examples of inconsistent pronunciation, the speaker suggested Percey Miles' essay written for Nicholson's Gardener's Dictionary as a guide, *i. e.* the adoption of the Roman method of pronunciation, although it is consistency that is desirable rather than any particular method. Prof. N. L. Britton moved that a standing committee on pronunciation be appointed, the members to be named by the President. The motion was carried.

Prof. B. D. Halsted spoke briefly on "The Peach-spotting Fungus as a Leaf-parasite," stating that the fungus effects numerous perforations in the peach leaves.

Mr. E. J. Durand presented notes on "The Development of *Olpidium* sp., one of the Chytridiaceæ." This plant is parasitic on *Spirogyra*. The unciliated zoospores work their way into the interior of the algal cell, where they grow in size and acquire a wall as the sporangium. The cell of the host is much swollen by the sporangium or several sporangia which occur within it. When the fungus approaches maturity a tube is given out from one side of the sporangium which extends to some distance outside the cell of the host, at the same time the protoplasm of the fungus becomes divided up into ciliated zoospores which finally escape through the tube by the rupture of its apex.

Prof. B. D. Halsted exhibited leaves of *Pæonia* discolored by some disease whose cause he had ascertained to be not from insects. He asked for suggestions from anyone as to its cause.

Dr. E. F. Smith explained a method for making pure cultures of fungi. The method consists in the usual distribution of spores in agar or gelatine to be poured subsequently into a Petrie dish. When the gelatine has become solid, the dish is inverted on the stage of a microscope, a single spore found and surrounded by a ring of ink on the bottom of the dish. The disk of gelatine is then cut out, put into another dish and fresh nutrient solution

poured over it. In this way the development of a single spore may be easily followed.

The President made an announcement of the organization of the Botanical Society of America, stating that the charter members selected by the Club at the Madison meeting had organized in Brooklyn by electing Prof. Wm. Trelease, President; Prof. N. L. Britton, Vice-President; Mr. John Donnell Smith, Treasurer, and Prof. C. R. Barnes, Secretary.

The committee appointed to nominate officers of the Club for next year reported as follows:

For President—Douglas H. Campbell, of Leland Stanford, Jr., University.

For Secretary—Frederick C. Newcombe, of Michigan University.

Signed, B. T. GALLOWAY,
G. H. HICKS,
E. J. DURAND,

Committee.

The report of the committee was accepted and adopted.

Prof. C. E. Bessey and Mr. Roscoe Pound explained the work of the Botanical Seminar in making a survey of the flora of Nebraska, and exhibited advance sheets of Parts I. and II. of the Flora of Nebraska.

Mr. M. B. Waite spoke of the killing of young shoots of the pear by excessive transpiration. The same speaker also offered suggestions on the staining of the flagellæ of bacteria.

Profs. Galloway, Bessey and Coville were named as the committee to prepare a statement for the convenience of publishers, that errors in the use of capitals in nomenclature might be avoided.

The Club then adjourned to meet at the assembling of the A. A. S. next year.

FREDERICK C. NEWCOMBE,
Secretary.

Organization of the Botanical Society of America.

Pursuant to a call issued by the committee appointed from the original members of the new national association of botanists, a meeting for organization was held at Brooklyn, N. Y., on August